SECTION C

WASTE CHARACTERISTICS

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APPENDIX

SECTION C – WASTE CHARACTERISTICS

Chemical and physical characteristics of waste stored in container storage areas or thermally treated at the open detonation (OD) grounds which may generate a hazardous waste are described in this section. A waste analysis plan is also included that covers sampling, testing, and evaluating the waste to assure that information sufficient for safe handling of wastes is available. The information submitted was developed in accordance with the requirements of 40 *Code of Federal Regulations* (CFR) §270.14(b)(2) and 40 CFR §264.13(a).

C-1 Chemical and Physical Analyses [40 CFR §270.14(b)(2) and 264.13(a)]

As indicated in 40 CFR §264.13(a)(1), before an owner or operator treats, stores, or disposes of any hazardous waste, detailed chemical and physical analyses of a representative sample of the waste must occur.

At a minimum, results of the analyses must include information that allows for effective treatment, storage, or disposal in accordance with 40 CFR §264.13 and Part 268, with the exception of the exclusions and modifications noted in *Kansas Administrative Regulations* (KAR) 28-31-268. Results of the required analyses may include information developed under 40 CFR Part261, with the exception of the exclusions and modifications noted in KAR 28-31-261, which include existing published or documented data on the hazardous waste, or knowledge of the hazardous waste generating process. The analyses must be repeated if the owner or operator is notified or has reason to believe that the process or operation generating the waste has changed.

Wastes generated fall into generic waste categories of particular physical and chemical properties based on constituent composition, generating process or operation, and waste characteristics. Tables C-1 through C-6 present a general description of wastes, including characteristics and the basis for hazard designation. Additional information and descriptions of explosive compounds, and information on military specifications for explosives are included as supplemental information.

C-1a Containerized Wastes [40 CFR §270.15(b)(1) and 264.172]

The hazardous wastes generated at Day & Zimmermann Kansas LLC (D&Z) are characterized after generation, and are all stored in U.S. Department of Transportation (DOT)-approved containers appropriate for the waste streams. The wastes determined to be hazardous are labeled accordingly at the point of generation. Section C-2 (Waste Analysis Plan) presents a discussion of waste analysis, including sampling and analytical parameters and rationale, sampling procedures, and analytical methods. Tables C-1 through C-4 provide additional information regarding waste characteristics.

As specified in the facility's Part A application, wastes with the following waste codes are stored in the D&Z hazardous waste storage areas: D001 – D011, D018, D022, D029, D030, D035, F001-F003, F005, K044-K047, U036, U122, and U132.

C-1b Waste in Tank Systems [40 CFR §270.16(a), 264.190(a), 264.191(b)(2) and 264.192(a)(2)]

Not applicable

C-1c Waste in Piles [40 CFR §270.18(a) and 264.250(c)(1) and (4)]

Not applicable

C-1d Landfill Wastes [40 CFR §270.21(a), 264.13(c)(3) and 264.314]

Not applicable

C-1e Wastes Incinerated and Wastes Used in Performance Tests [40 CFR §270.19(c), 270.62(b) and 264.341]

Not applicable

C-1f Wastes to be Land Treated [40 CFR §270.20(b)(4), 264.271(a)(1) and (2), 264.272, 264.276, Part 261, Appendix VIII]

Not applicable

C-1g Wastes In Miscellaneous Treatment Units [40 CFR §270.23(d)]

The OD grounds are used to thermally treat various explosives, pyrotechnics, propellants, and related items for demilitarization. Historical data, specifications, and ordnance publications available at the facility are consulted to obtain information regarding the nature of the waste to be detonated prior to any treatment. These data are sufficient to determine the suitability of the waste material for treatment utilizing the OD process.

General chemical compositions of typical wastes to be thermally treated in the OD unit are listed in Table C-2. Each type of munitions or waste varies in type and quantity of these constituents. Items treated in the OD unit are summarized in Table C-3a and Table C-3b.

The categories of wastes treated in the OD unit will consist primarily of military energetic materials and ordnance that have exceeded their "shelf-life," off-specification versions of these items, or various waste components from the manufacturing processes that cannot be recycled or otherwise disposed of safely off-site. Specific types of wastes treated at the OD unit at D&Z are listed in Table C-4.

The off-specification materials contain the same raw materials as usable items, but generally are deficient in meeting some performance specification. For such off-specification items, the appropriate treatment can also be determined based on published materials. If there is a difference in the composition of the off-specification materials that may render them unacceptable for treatment using OD process, data will be gathered to resolve the issue. In some instances, a small test detonation of such material may be possible; such a small test may provide adequate information on the applicability of the OD process to this waste. A test detonation may also be appropriate to determine acceptability of OD on materials for which little or no historical data exist, as it would not be feasible to do a complete chemical analysis of the materials based upon their presumed hazardous nature.

Information to ensure safe temporary holding of materials that are to be thermally treated in the OD unit is available in the historical data and ordnance publications. Regarding materials for which no such information is available, it may be necessary to perform chemical and physical analyses to determine reactivity, stability, and ignitability characteristics. The guidelines for performing such analyses are provided in the Waste Analysis Plan (see Section C-2). Under no circumstances will any material contaminated with or suspected of being contaminated with military chemical warfare agents be accepted for thermal treatment at the OD unit. Examples of such chemical warfare agents include:

- Choking agents
- Nerve agents

- Blood agents
- Blister agents
- Incapacitating agents
- Vomiting compounds
- Tear-producing compounds
- Herbicides.

Smokes and certain incendiary devices are not treated at this facility. Compounds contained within these either cannot be successfully treated by the OD process or are violently reactive such that they pose a severe health/safety hazard. These compounds are listed in Table C-5. However, under certain emergency conditions, these wastes may require treatment at the OD unit.

Based on the information in Table C-2, all of the waste accepted for thermal treatment in the OD unit will be considered hazardous prior to treatment, due to explosive or reactive characteristics. Full hazard characteristics analyses will not be performed during the permitted storage to avoid dangers associated with excessive handling of such materials and to eliminate potentially dangerous and costly delays in treatment of the wastes. The wastes are visually inspected prior to treatment to ensure that only appropriate wastes are subjected to thermal treatment.

Wastes accepted from off-site D&Z locations will be visually inspected upon arrival at D&Z. The materials will be inspected to ensure consistency with their descriptions and with the materials listed in Table C-2. Only wastes containing explosive materials similar to those previously managed at D&Z will be accepted from off-site locations.

After OD treatment, the immediate area surrounding the unit will be inspected, and any undetonated explosives will be collected and held until the next scheduled detonation. This ensures that any waste treatment residues collected for analysis and disposal are not of an explosive nature. Scrap metal fragments will be collected and sold to the public as salvage or disposed of in accordance with applicable DoD and environmental regulations.

The primary hazard characteristic of waste residue after thermal treatment stems from presence of heavy metals and possibly traces of the propellants or pyrotechnic (PEP) material. All waste residues from detonation are carefully examined utilizing process knowledge and the scrap metal is then picked up and sent for recycling. Any remaining unexploded ordnance is left in place and then re-detonated and the process is repeated until all items have been properly treated. Wastes determined to be reactive are retreated and then disposed of at a permitted off-site hazardous waste disposal facility. Other residues, hazardous but non-reactive, are disposed of at a permitted off-site hazardous waste disposal facility.

OD of hazardous wastes is prohibited under 40 CFR §264.17(b). Nonetheless, the U.S. Environmental Protection Agency (USEPA) has allowed exceptions to this prohibition as part of the interim status standards (40 CFR §264.382), which allow OD of waste explosives. Waste explosives are defined as "waste which has the potential to detonate and cannot safety be disposed of through other forms of treatment." Inherent in this definition is a requirement by the permit applicant to demonstrate lack of other currently available treatment technologies for safe disposition of waste explosives.

The energetic material items treated by detonation at D&Z clearly exhibit the characteristics of reactivity. This classifies them as a hazardous waste (assuming that the intent is to discard a given item, making it a solid waste). Reactive hazardous waste is classified as a D003 waste (§261.23). Propellants, energetics, and pyrotechnics typically exhibit explosive characteristics ranging from deflagration (very rapid pressure-rate-of-rise fires) to detonation. Both deflagration and detonation can cause extensive structural

damage and loss of life. The inherent safety problems with handling explosives, as reflected by accidents that have occurred at explosive manufacturing and demilitarization facilities, attest to need for detonation capabilities to routinely demilitarize outdated energetic material items. The detonation operation at D&Z serves an important purpose by allowing Military Services to dispose of ordnance in an effective and efficient manner that is more environmentally sound than other methods such as land disposal, and is less threatening to human health than if the explosive materials in each item would be reclaimed following deactivation of the item.

The U.S. Army and other branches of the U.S. military have been actively involved in several investigations of alternative treatment technologies for safe disposition of waste explosives. These include literature searches and subsequent evaluations of possible technologies and investigations of possible waste explosives use and reuse alternatives. In addition, the U.S. Army is actively conducting programs in alternative treatment and reuse technologies.

The goal of past and ongoing efforts has been to investigate alternatives to OD that are protective of human health and the environment, effective in reducing the reactive and toxic hazards of waste explosives, and do not pose a threat to worker health and safety. While some alternatives to OD have progressed past the conceptual or laboratory scale, most are still years away from significant application. Also, many of these technologies have been developed for specific applications only, and few of the fully-developed technologies have emphasized the needs of a varied waste stream or general disposal. For these reasons, it is the view of the U.S. Army that, at the present time, no single technology could be an alternative to detonation operations and would be suitable for disposing of the wide range of waste explosives now treated at D&Z and at other DoD installations around the country.

The U.S. Army has determined that at the present time, demilitarization of energetic material items by detonation is the best available control technology (*Demilitarization Alternative to Open Burning/Open Detonation, Technology Compilations*, Volume II, U.S. Army Armament Munitions and Chemical Command, Savanna, Illinois, June 1990).

C-1h Wastes In Boilers and Industrial Furnaces [40 CFR §270.66(c) and 266.102(b)]

Not Applicable

C-1i Wastes on Drip Pads [40 CFR §270.26 and 264.570]

Not Applicable

C-2 Waste Analysis Plan [40 CFR §270.14(b)(3) and 264.13(b) and (c)]

Table C-2 lists the wastes that are or may be thermally treated at this facility, and Table C-4 lists all wastes currently managed at this facility and that could be accepted from off-site facilities. As previously stated in Section C-1, all waste thermally treated is assumed hazardous prior to thermal treatment in the OD unit. A detailed waste analysis is not necessary to ensure successful treatment by OD, as the constituents of the PEP wastes, as well as its ballistic properties, are well known prior to treatment. Material Safety Data Sheets (MSDS) for the constituents subjected to OD treatment are on file at this facility or would be received from the off-site D&Z facility prior to agreement to accept the waste for treatment. Table C-6 lists physical properties of the materials being or planning to be thermally treated at this facility; Table C-6, in conjunction with Table C-1, demonstrates that OD will successfully treat these wastes.

All wastes routed for storage in the HW storage are assumed hazardous prior to storage or are tested after storage (see Table C-12).

D&Z manages two major classes of wastes: hazardous wastes with explosive constituents or components, and non-explosive hazardous wastes. Explosive hazardous wastes are treated and/or stored at D&Z prior to shipment to an off-site facility or treatment on-site at the OD grounds. Non-explosive hazardous wastes are not treated on site, but may be stored as D&Z pending off-site treatment and disposal.

Based on information contained in specifications and waste profiles, and knowledge of the products, incompatible wastes are not stored together at D&Z. This information is also utilized to comply with explosive limits for storage units, feed rates for treatment units, and adherence to DoD Explosive Safety Board (DDESB) requirements.

Constituents of the wastes and their physical and chemical properties are well known prior to treatment. MSDSs for the constituents subjected to thermal treatment at the OD unit or stored at the HW storage areas are on file at this facility. Table C-3a and Table C-3b list physical properties of the materials currently thermally treated at this facility or planned for thermal treatment. Specifications for the substances are strict, and tolerances (variations) are small. Because testing these substances to determine exact chemical characteristics would be dangerous (as would delays in routing wastes for treatment), full chemical characterization is not performed prior to treatment. Additional data on the physical properties of these items are in the supplemental information.

The purpose of the following waste analysis plan, therefore, is to gather information that will aid this facility in:

- Qualifying rejected munitions and energetic materials ordnance for treatment at OD Grounds
- Characterizing non-PEP hazardous wastes to be stored in the HW storage area or disposed of at an authorized hazardous waste disposal facility off site
- Characterizing residues remaining after thermal treatment in the OD unit
- Selecting off-site disposal of hazardous wastes generated on site.

The waste analysis plan provides the physical and chemical information necessary to properly handle personnel protection requirements, to characterize waste for storage and/or identify treatment limitations, and to determine compliance with operating limits. The current edition of SW-846 is utilized as required for waste analysis.

The following sections describe procedures used to comply with 40 CFR §264.13.

C-2a Parameters and Rationale [40 CFR §270.14(b)(3) and 264.13(b)(1)]

This section presents the types of parameters evaluated and the rationale for these parameters during management of hazardous wastes at D&Z. The two phases of facility hazards waste are as follows:

- Post-treatment procedures for waste residue
- Disposition of hazardous waste.

Pre-Acceptance Procedures

Table C-4 lists by specific waste names the hazardous wastes generated on site or potentially received from off-site D&Z facilities. Waste generated on site will be evaluated for indicated parameters as listed in Table C-7.

Table C-8 lists waste codes authorized at D&Z. The facility is authorized only for these codes. Table C-9 lists mandatory analyses of hazardous waste treated in the OD unit.

Wastes will be observed or tested for a number of physical characteristics. Waste residues will also be tested for the four Kansas hazardous waste program characteristics (ignitability, reactivity, corrosivity, and toxicity) as appropriate, depending on the nature of the waste. The waste analysis plan flow scheme is shown on Figure C-1.

The physical state of a semi-solid waste is first determined by use of the paint filter test. This test is not performed on wastes that are obviously solid or obviously contain free liquid. If free liquids are found, ignitability and pH analyses are performed on that portion of the waste. The test for ignitability is conducted because explosive-contaminated solvent residue may be present. A measurement of pH of the waste occurs to determine container compatibility.

If the waste obviously contains no free liquids, it is subjected to the reactivity test to determine if hazardous quantities of the PEP material are present. This test also serves as a measure of the effectiveness of thermal treatment of this waste. Positive results from the reactivity test indicate incomplete treatment, and the waste residue is resubmitted for OD treatment, as appropriate.

Post-Treatment Procedures for Waste Residues

After characteristic hazardous wastes are treated in the OD unit, as illustrated on Figure C-1, any residues will be tested for reactivity or characteristic toxicity. Toxicity will be determined by application of the Toxicity Characteristic Leaching Procedure (TCLP). The waste is subjected to testing to determine if hazardous quantities of the PEP material are present. The residues are also tested for other Kansas hazardous waste program characteristics or for presence of other hazardous waste constituents, depending on generic category of the wastes that were routed to the OD unit for treatment (see Table C-1). This information is utilized to determine management and handling of the residues, including a determination whether the residues will be routed for additional treatment and an assessment of container compatibility for the wastes. Analytical requirements for waste destined for off-site management are satisfied to comply with 40 CFR Part 268, with the exception of the exclusions and modifications noted in KAR 28-31-268.

Figure C-1 shows the flow of facility management and disposition criteria for generic waste streams, treatment and disposal options for generic hazardous waste categories, and flow logic diagrams allowing determination whether the land disposal restrictions (LDR), 40 CFR Part268, with the exception of the exclusions and modifications noted in KAR 28-31-268, regulations have been met for hazardous waste residues generated at the OD unit.

C-2b Test Methods [40 CFR §270.14(b)(3) and 264.13(b)(2)]

Test procedures in the previous section are listed in Table C-9, along with method numbers and volume requirements. All methods referenced are from *Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846*, 3rd edition, USEPA, 1986, unless otherwise noted. The laboratory

performing these analyses will operate in accordance with a quality assurance (QA)/quality control (QC) plan equivalent to that detailed in Chapter 1 of SW-846.

The typical analytical methods used to determine residue characteristics are:

1. TCLP, Method 1311 of SW 846, (from *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, 3rd Edition, USEPA, 1986).

2. Gap Test for Determination of Explosive Reactivity, (from *Procedures for Classification of Explosive Substances*, U.S. Bureau of Mines, Department of the Interior [DOI], 1984).

3. Internal Ignition Test for Determination of Explosive Reactivity, (from *Procedures for Classification of Explosive Substances*, U.S. Bureau of Mines, DOI, 1984.

4. Analysis for Explosives in Soils, High Performance Liquid Chromatographic Method, (from *Water Quality Information Paper No. 23: Military Unique Munitions Analytical Procedure*, United States Army Environmental Hygiene Agency [USAEHA], March 16, 1987).

Maximum allowable contamination levels for waste residues are listed in Table C-10.

C-2c Sampling Methods [40 CFR §270.14(b)(3) and 264.13(b)(3)]

As noted above, wastes that potentially contain explosive components are not sampled or tested prior to placement in storage or routing for treatment. Residues generated through treatment at the OD Grounds and wastes not potentially contaminated with explosives are sampled as described in Table C-9. The hazardous wastes that are sampled and require specific analyses are spent non-halogenated solvents, paint sludge and thinner, sump sludge, and industrial wastewater treatment sludge/spent carbon. The sampling method and typical equipment used for these wastes are itemized in Table C-9.

C-2d Frequency of Analysis [40 CFR §270.14(b)(3) and 264.13(b)(4)]

As noted previously, wastes that potentially contain explosive components are not sampled or tested prior to placement in storage or routing for treatment. Wastes routed for storage that are not potentially contaminated with explosive are, at a minimum, sampled at frequencies as listed in Table C-11. Table C-11 itemizes the type of analysis and frequency for generated waste.

C-2e Additional Requirements for Wastes Generated Off-Site [40 CFR §270.14(b)(3), 264.13(b)(5) and (c), 264.73(b), 264.71, and 264.72]

D&Z will maintain a written operating record at the facility to document all off-site wastes received for thermal treatment from other D&Z facilities. The operating record will include the following:

- Description and quantity of each hazardous waste received, and method and date of its treatment, storage, or disposal
- Location of each hazardous waste within the facility and the quantity at each location
- Records and results of waste analyses and waste determinations
- Summary reports and details of all incidents that require implementing the contingency plan
- Records and results of inspections

- Monitoring, testing or analytical data, and corrective action where required
- Notices to generators as specified in 40CFR264.12(b)
- Copies of notices from generators as required by 40CFR268.7 or §268.8

The waste analysis plan will specify the procedures to be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that this waste matches the identity of the waste designated on the accompanying manifest or shipping paper. At a minimum, the waste analysis plan must describe: (1) procedures to determine the identity of each waste moved for management at the facility, and (2) sampling method applied to obtain a representative sample of the waste to be identified, if the identification method includes sampling.

All hazardous wastes received from off-site D&Z facilities will be sent via uniform hazardous waste manifest will be managed in accordance with the requirements set out in 40CFR264.71 and §264372.

C-2f Additional Requirements for Ignitable, Reactive or Incompatible Wastes [40 CFR §270.14(b)(3), 264.13(b)(6) and 264.17]

All waste materials treated as a single operation within the OD unit or stored in a single location are compatible. Waste compatibility groups are assigned during the generation process for on-site waste. The operators of the OD unit check and verify the compatibility group of wastes upon receipt in the area. The incoming load procedures require that waste compatibility is checked and verified for received shipments. Compatibility is determined utilizing the criteria presented in 40 CFR §264 Appendix V and through application of the generic waste category determinations described above. Additional requirements for ignitable and reactive (IR) wastes may be applicable due to safety hazards related to management of these wastes. See Section D for a description of the general precautions and specific management requirements for ignitable, reactive, and incompatible (IRI) wastes.

Post-Contingency Plan Incident Procedures

Facility management under direction of the On-Scene Coordinator (OSC) will evaluate potential for incompatible waste problems, using information contained in Section C. The OSC will reference available information in the daily operating record to determine the composition of waste involved in the incident. By use of the compatibility information contained in the existing information, the OSC will ensure that the waste is not placed so as to pose potentially dangerous situations. Constituents of wastes and waste residues are listed in Tables C-1, C-2, and C-3. Criteria for incompatibilities are listed in Section F.

C-2g Additional Requirements Pertaining to BIF Facilities [40 CFR §270.22, 266.102(e)(6)(ii)(C) and (e)(6)(iii)]

Not applicable.

C-3 Waste Analysis Requirements Pertaining to Land Disposal Restrictions [40 CFR §270.14(b)(3), 264.13, 264.73, and Part 268 (with the exception of the exclusions and modification noted in KAR 28-31-268)]

Information collected by D&Z based on knowledge of the waste can be used to determine the applicability of 40 CFR Part 268, with the exception of the exclusions and modifications noted in KAR 28-31-268. If D&Z elects only to provide information from knowledge of the waste, the supporting data must be maintained in the facility operating record.

D&Z generates waste solvents. The hazardous waste codes restricted from land disposal under §268.30 are F001-F005, F020-F023, F026, and F028 (dioxin containing waste).

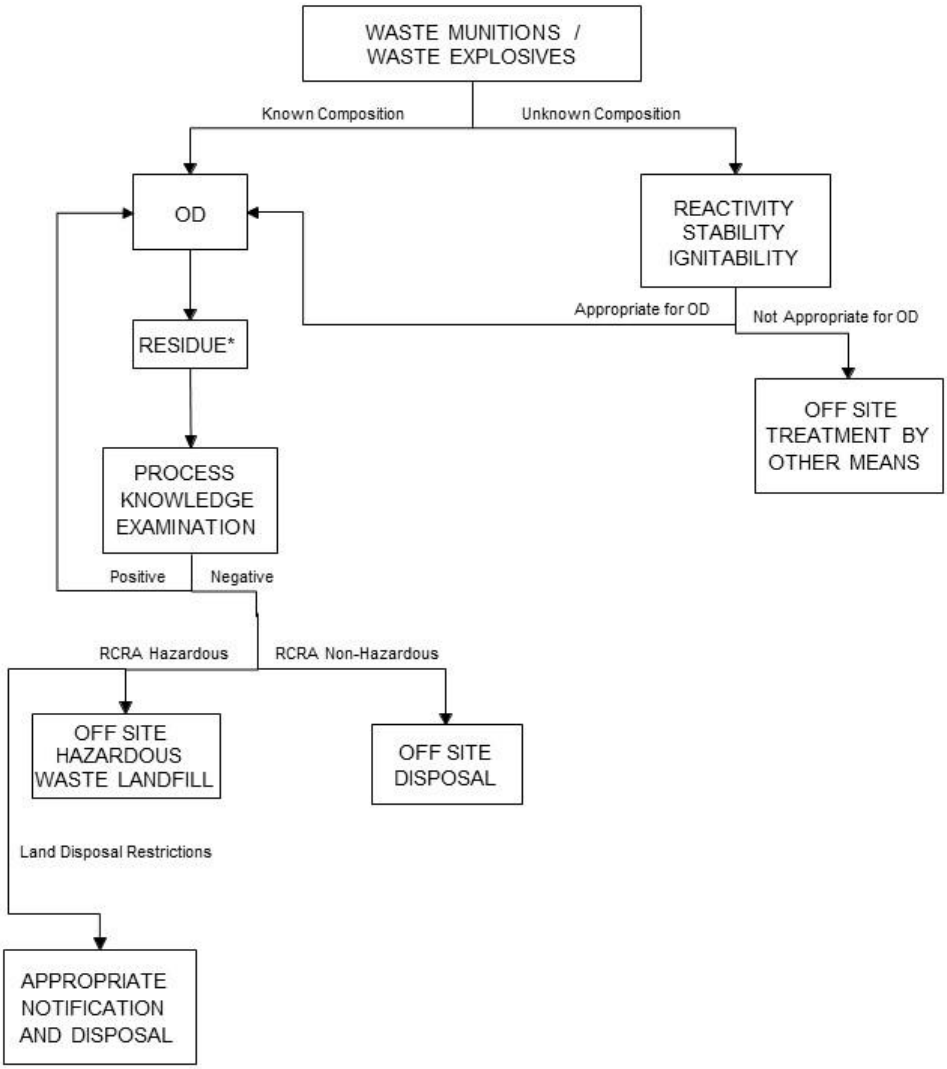
As indicated in 40 CFR Part 268, specific wastes are prohibited from land disposal.

D&Z conforms to the treatment standards as listed in 40 CFR §268.40. LDR waste analysis and recordkeeping requirements listed in 40 CFR §268.7 and 268.9, with the exception of the exclusions and modifications noted in KAR 28-31-268.7, apply to D&Z. Figure C-1, D&Z Schematic of Hazardous Waste Management by Generic Waste Group, shows the sequence of management options: storage, treatment, and disposal of particular types of waste streams. Figure C-1 shows the major criteria for compliance with LDRs or the OD area.

FIGURES

FIGURE C-1

WASTE ANALYSIS FLOW SCHEME



* If waste is a listed hazardous waste, residue will be managed as a hazardous waste.

TABLES

TABLE C-1

SPECIFICATION REFERENCE FOR PROPELLANTS

Title	Number
Propellant Artillery	MIL-P-270A
Propellant Charge for Rocket, Practice,35MM Subcaliber, M73	MIL-P-50981A(1)
Propellant Charge for Assy Rocket, HE, 66MM, M72A1, w/coupler	MIL-P-60009A
Propellant Charge Nuclear Component	MIL-P-4819A
Propellant Charge, Nuclear Component, Tng	MIL-P-50838
Propellant Charge, Rocket, M180	MIL-P-50202A(4)
Propellant CT3N 23-17	MIL-P-85364
Propellant Double Base Sheet, IM36	MIL-P-48357A(1)
Propellant Feed System, Rocket Propulsion, General Specification For	MIL-P-27409(1)
Propellant for Small Arms Ammunition	MIL-P-3984G(3)
Propellant for 20MM Aircraft Gun Mark 12	MIL-P-18942A(3) NOTICE (1)
Propellant for 20MM Ammunition	MIL-P-81994
Propellant Grain M753 for 8" Projectile	MIL-P-63159
Propellant Grain, Cylindrical, for Rocket Motors	MIL-P-18906(1)
Propellant Grain, Mk 43, Mod 1	MIL-P-18811A(2)
Propellant Grain, M28	MIL-P-60071A(1)
Propellant Grain Igniter	MIL-P-82691
Propellant M1 for Use in Charge, Propelling, IM164	MIL-P-43848
Propellant Ml Type II (Master Lot) for Use in Charge XM72	MIL-P-14768(1)
Propellant M1 for Use in Charge, Propelling, M4A2	MIL-P-603973
Propellant M1 for Use in Charge, Propelling, 155MM, M3A1 for 155MM Howitzer Cannon	MIL-P-60416A(1)
Propellant Ml for Use in 90MM Cartridges	MIL-P-48759
Propellant M10 for Use in Cartridges, for 37MM Rifle, M18 and M18A1	MIL-48051A
Propellant M10 for 81MM Mortar Propelling Charges	MIL-P-48130A(1)
Propellant M14 for Use in Cartridge 105MM TP-T M490E1	MIL-P-63517
Propellant M26 (T28) for Use in Increment IM90E1 for 81MM Mortar	MIL-P-46993
Propellant M26 for Use in Cartridge, Antipersonnel XM581 for 106MM Rifle M40A1	MIL-P-60375
Propellant M26A1 for Use in Charge Propelling M189	MIL-P-50472A
Propellant M30 for Use in Cartridge 105MM, APFSDS-T M833	MIL-P-63515A
Propellant M30 for Use in Cartridge 105MM APFSDS-T, M735, M735A, and XM774	MIL-P-631053(1)
Propellant M30 for Use in Cartridge 105MM HEAT-T M436A1, HEAT-T-MP M436A1E2 and TP-T, M490	MIL-P-46458F
Propellant M30A1 for Use in 155MM Propelling Charges	MIL-P-48349
Propellant M30 for Use in Cartridge, 105MM, APDS-T, M728	MIL-P-48266A
Propellant M30 for Use in Cartridge, 105MM, TPDS-T, M724A1	MIL-P-481543
Propellant M30 for Use in Cartridge, 90MM, Antipersonnel, XM380 for Guns M36 and M41	MIL-P-60382(1)
Propellant M30 for Use in 105MM Cartridge HEAT-T, M522	MIL-P-63301

TABLE C-1

SPECIFICATION REFERENCE FOR PROPELLANTS

Title	Number
Propellant M30 for Use in Cartridges, TP-T M3531A1 and AP-T M318A1E1 and 90MM Guns	MIL-P-46999B
Propellant M30 Type 1 for Use in Charge, XM72, Zone III	MIL-P-14769
Propellant M30 for Use in Cartridge, HEAT-T M431 for 90MM Guns	MIL-P-46600C
Propellant, M30A1 (M30E1) for Use in Charge, Propelling 105MM, XM176, for Cartridge, HE, XM548 for Howitzers M101, M102, and M018	MIL-P-60422(1)
Propellant, M03A1 for Use in Charge Propelling, M203	MIL-P-48367(3)
Propellant M30A1 for Use in Charge, Propelling XM201E2	MIL-P-48366(1)
Propellant M30A1 for Use in Charge, Propelling, XM203 for 155MM Projectile, Rocket-assisted, M549	MIL-P-48257
Propellant M30A1 for Use in Charge, Propelling XM201E1 for 155MM Projectile, Rocket-assisted M549	MIL-P-48256
Propellant M30A2 for Use in Charge Propelling, M188 and M188E1 for 8 Inch Projectiles	MIL-P-48181C
Propellant M30E1 for Use in Propelling Charge M85 and XM121 for 105MM Howitzer	MIL-P-46631B(1)
Propellant M31E1 for Use in Charge Propellant M188E2 for 8 Inch Projectiles	MIL-P-63341A
Propellant M5 for Use in Charge, Propelling, XM178 or 90MM Recoilless Rifle	MIL-P-60358(1)
Propellant M6 for Use in Cartridge 105MM HEP-T, M327	MIL-P-48058
Propellant M6 for Use in Cartridge, 105MM APERS-T M494	MIL-P-48231
Propellant M6 for Use in Cartridge, 76MM HEAT-T, M496	MIL-P-46484A
Propellant M6 for Use in Cartridge, 90MM, APERS, XM380E1 for Guns M36 and M41	MIL-P-60417
Propellant M6 for Use in Cartridge, 90MM, Canister, M377	MIL-P-60465
Propellant M6 for Use in Cartridge, 90MM, TP-T, M353	MIL-P-60359
Propellant M6 for Use in Charge, Propelling, M119, 135MM	MIL-P-14940B(1)
Propellant M6 for Use in Charge Propelling 175MM, M199 and M86A2B1	MIL-P-46230C
Propellant M6 for Use in Charge Propelling 135MM, M119A2	MIL-P-63404
Propellant, M6 for Use in Charge, Propelling, (Green Bag) 175MM, XM124	MIL-P-60384(2)
Propellant M9 for Use in Charge, Propelling, M36A	MIL-P-48127
Propellant M9 for Use in Increments M90 and M90A1 for 81MM Mortar	MIL-P-60029B(1)
Propellant M9, Flake (For Use in Ignition Cartridges)	MIL-P-60398A(1)
Propellant M9, Flake (For Use in 40MM Cartridges)	MIL-P-30206(2)
Propellant Powder (For Use in Base Grain OGX)	MIL-P-604638B
Propellant Pressurizing Agent, Helium	MIL-P-27407A
Propellant Pressurizing Agent, Nitrogen	MIL-P-27401C
Propellant, Ammonia	MIL-P-27406
Propellant, Ball Powder for Cartridge, 105MM, HE, XM710	MIL-P-63084
Propellant, Booster, Grain-Ignition (For Torpedo Mk 46 Mod O)	MIL-P-81095 NOTICE 1
Propellant, Cannon, Naco	MIL-P-19264A NOTICE 1
Propellant, Chlorine Pentafluoride	MIL-P-27413

TABLE C-1

SPECIFICATION REFERENCE FOR PROPELLANTS

Title	Number
Propellant, Chlorine Trifluoride	MIL-P-81399A
Propellant, Double Base Sheet M36	MIL-P-48357A
Propellant, Double Base Sheet N5	MIL-P-17689
Propellant, Composite ADC-109	MIL-P-83405
Propellant, Double Base, Type N-2 (JPN)	MIL-18617
Propellant, Ethylene Oxide (Asg)	MIL-P-8845A
Propellant, Fluoride	MIL-P-27405(2)
Propellant, Foam (For Torpedo Mk 46 Mod 0)	MIL-P-81069(1)
Propellant, Furfuryl Alcohol	MIL-P-45702B
Propellant, Grain, Inhibited	MIL-P-60852A
Propellant, High Density Synthetic Hydrocarbon Type, Grade JP-9 & JP-10	MIL-P-87107B(1)
Propellant, Hydraxine	MIL-P-26536C(2)
Propellant, Hydraxine - UNS-DIMETHYLHYDRAZINE (50 Percent N2H4 - 30 Percent udmh)	MIL-P-274023
Propellant, Hydrogen	MIL-P-272013
Propellant, Hydrogen Peroxide	MIL-P-16005E
Propellant, H8	MIL-P-23929A
Propellant, Kerosene	MIL-P-25576C(2)
Propellant Igniter X-62	MIL-P-85489
Propellant, M1 for Use in Charge Propelling for 75MM How M1A1 and M3	MIL-P-46990
Propellant, Mixed Amine Fuel, MAF-1	MIL-P-23741A(1)
Propellant, Mixed Amine Fuel, MAF-3	MIL-P-23686A(1)
Propellant, Mixed Oxides of Nitrogen	MIL-P-27408A
Propellant, Monomethylhydrazine	MIL-P-27404B
Propellant, M1 for Use in Charge Propelling M2 (White Bag) for 8 Inch Howitzer	MIL-P-46699B
Propellant, M1 for Use in Charge, Propelling, M67 for 105MM Howitzer	MIL-P-603183
Propellant, M1 for Use in 105MM Cartridges	MIL-P-46252C
Propellant, M1 for Use in Charge Propelling Ml (Green Bag for 8 Inch Howitzer)	MIL-P-46698
Propellant, Ml for Use in Charge, Propelling, 155MM, M3	MIL-P-46913
Propellant, M10 (For Use in Special Applications)	MIL-P-48099A
Propellant, M10 for 60MM Mortar M204 Propelling Charge	MIL-P-63194A
Propellant, M15 and M17	MIL-P-668A
Propellant, M17, for Use in Cartridge, 76MM, AP-T M33, and 76MM TP-T, M340A1	MIL-P-46522(1)
Propellant, M2 and M5	MIL-P-323A
Propellant, M2 for M5 Subsystem Ammunition	MIL-P-60989A(1)
Propellant, M2 for Use in 165M Cartridges	MIL-P-60045A
Propellant, M2 for Cartridge, 37MM, TP, M63 Mod1	MIL-P-46663
Propellant, M26 (T28) for Use in Cartridges M344 and M346, in 105MM Rifles	MIL-P-46235A
Propellant, M26A1, for Use in Charge Propelling XM189 and XM190	MIL-P-30472(A)

TABLE C-1

SPECIFICATION REFERENCE FOR PROPELLANTS

Title	Number
Propellant, M30 (T36), for Use in Cartridge, 105MM HEAT-T, M456A1 and TP-T M490	MIL-P-46458F(1)
Propellant, M30 for Use in Cartridge 105MM APFDS-T, M735	MIL-P-63103B(1)
Propellant, M30 for Use in Cartridge, 105MM, APDS-T, M392A2	MIL-P-16489C(1)
Propellant M30 for Use in Cartridges 76MM, AP-T, M339 and TP-T, M340A1	MIL-P-60389A
Propellant M30A1 for Use in Charge, Proof, 155MM PXR-6255	MIL-P-48372
Propellant M30A1 for Use in Charge, Proof, 155MM PXR-6297	MIL-P-63387
Propellant, M31(T34), for Use in Charge Propelling, M45 for Projectiles M365 and M367, for 120MM Gun, M58	MIL-P-46683A(1)
Propellant, M5 (For Use in Special Applications)	MIL-P-48089(1)
Propellant, M5 for Use in Cartridge, 90MM, HEAT, M371 and M371E1	MIL-P-46426A
Propellant, M6 for Use in Cartridge, Canister, 76MM M363	MIL-P-60098
Propellant, M7	MIL-P-14737(2)
Propellant M9 (For Use in Base Charge Assemblies)	MIL-P-60363A
Propellant, M9 (For Use in M19A2 Signal)	MIL-P-60354(1)
Propellant, M9, for Use in Increment, M185 for 81MM Mortar	MIL-P-50418
Propellant, M9 for Use in Increment, M5 for 81MM Mortar	MIL-P-50425
Propellant M9 for Use with Charge, Propelling M36A1 for 4.2 inch Mortar	MIL-P-60019A(3)
Propellant M9 for Use in Cartridge, Ignition XM702E1	MIL-P-63195(1)
Propellant, Nitric Acid	MIL-P-7245F(2)
Propellant, Nitrogen Tetroxide	MIL-P-26539C(2)
Propellant, Oxygen	MIL-P-25508E(3)
Propellant, Pressurizing Agent, Argon	MIL-P-27415
Propellant, Pyrocellulose	MIL-P-231A(2)
Propellant, Rocket Motor, Rocket High Explosive, 345M KM130	MIL-P-53028
Propellant, T36E1, for Use in Charge, Propelling, 155MM XM119 (Supercharge)	MIL-STD-2100
Propellant Solid for Cannon Requirements and Packing	MIL-STD-652D NOTICE 2 NOTICE 4
Propellant, Soluentless Type 37 for Projectile 155M, HE, Rocket Assisted, M549 & MS49A1	MIL-P-63201
Propellant, Solid, Gas Generator	MIL-P-47144
Propellant, Solid, Sampling, Examination and Testing	MIL-STD-286B NOTICE 4
Propellant, Spheroidal Ball Powder	MIL-P-48335
Propellant, T2	MIL-P-45460A
Propellant, T36E1, for Use in Charge, Propelling 155M, XM119 (Supercharge)	MIL-P-60033B
Propellant, T36E1, for Use in Charge, Propelling, 155M, M51	MIL-P-46902
Propellant, T36E1 for Use in Charge, Propelling, 155MM, XM115 (White Bag)	MIL-P-46953(2)
Propellant, U.S. Navy Guns, Ballistic Appendix	MIL-P-22314(3)
Propellant, Uns-dimenthylhydrazine - Jet Fuel	MIL-P-26694B(2)
Propellant, Uns-demethylhydrazine	MIL-P-25604D(1)

TABLE C-1

SPECIFICATION REFERENCE FOR PROPELLANTS

Title	Number
Propellant, M6 for Use in Charges, Propelling, 175MM M199 and M86A2B1	MIL-P-46230C

Note:

These specifications were obtained from the Department of Defense Index of Specifications and Standards (DODISS) current as of the date of handout publication. DODISS should be consulted when complete, up-to-date information is desired.

TABLE C-2

GENERAL DESCRIPTION OF HAZARDOUS WASTES THERMALLY TREATED OR STORED AT D&Z

PROPELLANTS:

Name	Chemical Formula	Hazardous Waste ID No.
Nitrocellulose	$C_{12}H_{16}(ONO_2)_4O_6$	D003
Nitroglycerin	$C_3H_5N_3O_9$	D003
Nitroguanidine	$CH_4N_4O_2$	D003

Note: These three primary constituents can be used singularly or in various combinations with metals, metallic salts, and organic polymer binders.

PRIMARY EXPLOSIVES:

Name	Chemical Formula	Hazardous Waste ID No.
Lead azide	N_6Pb (71% Pb)	D003, D008
Mercury fulminate	$C_2HgN_2O_2$ (70.5% Hg)	P065, D003, D009
Diazodinitrophenol (DDNP)	$C_6H_2N_4O_5$	D003
Lead styphnate	$C_6HN_3O_8Pb$ (44.2% Pb)	D003, D008
Tetracene	$C_{18}H_{12}$	D003
Potassium Dinitrobenzofuroxane (KDNBF)	$C_6H_2N_4O_6K$	D003
Lead Mononitroresorcinate	$C_6H_3NO_2Pb$ (57.5% Pb)	D003, D008

Note: The primary compositions are mixtures of primary explosives, fuels, oxidizers, and binders, including the following:

Name	Chemical Formula	Hazardous Waste ID No.
Fuels:		
Lead thiocyanate	$Pb(SCN)_2$ (64% Pb)	D003, D008
Antimony sulfide	S_5Sb_2	D003
Calcium silicide	$CaSi_2$	D003, D001
Oxidizers:		
Potassium chlorate	$C1O_3K$	D003
Ammonium perchlorate	NH_4C1O_4	D003
Barium nitrate	N_2O_6Ba	D003, D005

ALPHATIC NITRATE ESTERS:

Name	Chemical Formula	Hazardous Waste ID No.
1,2,4-Butanitriol trinitrate (BTN)	$C_4H_7N_3O_9$	D003
Diethyleneglycol dinitrate (DEGN)	$C_4H_8N_2O_7$	D003
Nitroglycerine (NG)	$C_3H_5N_3O_9$	D003
Nitrostarch (NS)	$C_6H_{10}O_5NO_2$	D003
Pentaerythyritol tetranitrate (PETN)	$C_5H_8N_4O_{12}$	D003
Triethylene glycoldinitrate (TEGN)	$C_6H_{12}O_4N_2O_4$	D003
1,1,1-Trimethylolethane trinitrate (TMETN)	$C_5H_9O_9N_3$	D003
Nitrocellulose	$C_{12}H_{16}(ONO_2)_4O_6$	D003

TABLE C-2

GENERAL DESCRIPTION OF HAZARDOUS WASTES THERMALLY TREATED OR STORED AT D&Z

NITRAMINES:

Name	Chemical Formula	Hazardous Waste ID No.
Cyclotetramethylene tetranitramine (HMX)	$C_4H_8N_8O_2$	D003
Cyclotrimethylene tetranitramine (RDX)	$C_3H_6N_6O_6$	D003
Ethylenediamine dinitrate (EDDN; Haleite)	$C_2H_6N_4O_4$	D003
Nitroguanidine (NQ)	$CH_4N_4O_2$	D003
2,4,6-Trinitrophenylmethylnitramine (Tetryl)	$C_7H_5N_5O_8$	D003

NITROAROMATICS:

Name	Chemical Formula	Hazardous Waste ID No.
Ammonium picrate (Explosive D)	$C_6H_3N_3O_7H_3N$	D003
1,3-Diamino-2,4,6-trinitrobenzine (DATB)	$C_6H_4N_5O_6$	D003
2,2'4,4'6,6'-Hexanitroazobenzene (HNAB)	$C_{12}N_8O_{12}$	D003
Hexnitrostilbene (HNS) trinitrobenzene	$C_{14}H_2N_6O_{12}$	D003
1,3,5-Triamino-2,4,6-trinitrobenzene (TATB)	$C_6H_6N_6O_6$	D003
2,4,6-Trinitrotoluene (TNT)	$C_7H_5N_3O_6$	D003
Ammonium nitrate	HN_4NO_3	D003

Note: The compositions are mixtures of the above compounds.

Name	Chemical Formula	Hazardous Waste ID No.
Plastic Bonded Explosives (PBX)	Varied	D003

Note: Plastic bonded explosives include mixtures of the above compounds, polymer binders, plasticizer, and fuel (aluminum or iron).

PYROTECHNICS:

Note: Pyrotechnics are composed of a combination of an oxidizer (oxygen or fluorine), fuel (powdered aluminum or magnesium), and binding agents (resins, waxes, plastics, oils, retardants, waterproofing, and color intensifiers).

MISCELLANEOUS:

Name	Chemical Formula	Hazardous Waste ID No.
Sludge from settling sumps, wash vacuum	Unknown	D003

TABLE C-3A

CHEMICAL COMPOSITION OF WASTES TREATED OR STORED AT D&Z

The information contained in this table is an approximation only. Specific information regarding percentages and tolerances of components should be obtained from appropriate specifications and standards. Numbers within chart are percentages by weight.

Propellant Model Designation

Component	M1	M2	M5	M6	M7	M8	M9	M10	M12	M13	M14	M15	M16	M17
Nitrocellulose	85.0	77.45	81.95	87.0	54.6	52.15	57.75	98.00	97.70	57.30	90.00	20.0	55.50	22.0
Nitroglycerin		19.50	15.00		35.5	43.00	40.00			40.00		19.0	27.50	21.5
Nitroguanidine												54.7		54.7
Dinitrotoluene	10.0			10.0					Coating			8.00		10.50
Dibutylphthalate	5.0			3.0							2.00			
Diethylphthalate						3.00								
Diphenylamine	1.0*				1.0*				1.0	0.80	0.20	1.00*		
Ethyl Centralite		0.60	0.60		0.9	0.60	0.75			1.00		6.0	4.00	1.5
Barium Nitrate		1.40	1.40											
Potassium Nitrate		0.75	0.75			1.25	1.50							
Potassium Perchlorate					7.8									
Lead Carbonate	1.0*													
Potassium Sulfate	1.0**			1.0*				1.0	0.75	1.50			1.50	
Tin									0.75					
Carbon Black					1.2					0.05*			0.50	
Graphite		0.30	0.30					0.1 Glaze						0.1 Glaze
Cryolite												0.3		0.3

TABLE C-3A

CHEMICAL COMPOSITION OF WASTES TREATED OR STORED AT D&Z

Component	M26	M26 E1	M30 A1	M30	M31	T2	T8	M18	IMR A1	M30 A2	M31 A1	T23
Nitrocellulose	67.25	68.70	28.00	28.00	20.00	57.50	58.00	80.00	100.0	27.00	20.00	67.25
Nitroglycerin	25.00	25.00	22.50	22.50	19.00	30.00	22.50	10.00		22.50	19.00	25.00
Nitroguanidine			47.00	47.00	54.70					46.25	54.00	
Dinitrotoluene						2.50	2.50		8.00			
Dibutylphthalate					4.50			9.00				
Ethyl Centralite	6.00	6.00	1.50	1.50		8.00	8.00			1.50		6.00
Barium Nitrate	0.75											0.75
Potassium Nitrate	0.70									2.75		0.70
Carbon Black						0.02*						
Graphite	0.30	0.30	0.10 Glaze									0.30
Cryolite			0.30		0.30							
Lead Stearate						0.50	0.50					
2-Dinitrodiphenyldiamine				1.50								
Potassium Sulfate				1.00		1.50			1.00*		1.50	
Diphenylamine								1.00	0.70		1.00	
Triacetin							8.50					

Notes:

* Added basis
** When specified, added basis

TABLE C-3B

CHEMICAL COMPOSITION OF WASTES TREATED OR STORED AT D&Z

Explosive		Chemical Make-up	
1.	AFX-900	Nitroguanidine RDX Aluminum Wax	45% 22% 17% 16%
2.	AFX-1100	TNT Aluminum Wax	66% 18% 16%
3.	AHH	Nitrocellulose Nitroglycerine 2 – dinitrodiphenylamine Lead Stearate Lead 2-Ethyl Hexoate	83% 11.4% 1.0% 2.3% 2.3%
4.	Amatol	Ammonium Nitrate TNT	
5.	Ammonium Nitrate	Ammonium Nitrate	100%
6.	Ammonium Perchlorate	Ammonium Perchlorate	100%
7.	Black Powder	Potassium Nitrate Charcoal Sulfur	74.0% 15.6% 10.4%
8.	Composition A3	RDX Wax	91% 3%
9.	Composition B	60/40 Cyclotol RDX TNT Wax	 39% 39% 1.7%
10.	Composition C4	RDX Polysobutylene Motor Oil Di-(2-Ethylhexyl) Sebacate	91.0% 2.1% 1.6%` 5.3%
11.	Composition CH-6	RDX Calcium stearate Polyisobutylene Graphite	97.5% 1.5% 0.5% 0.5%
12.	Explosive A	Ammonium Picrate Other	97% 3%
13	Explosive D	Ammonium Picrate	100%

TABLE C-3B

CHEMICAL COMPOSITION OF WASTES TREATED OR STORED AT D&Z

Explosive		Chemical Make-up	
14.	Haleite	(EDNA) (Ethylene-Dinitramine)	100%
15.	HBBX-1, 3 & 6	RDX TNT Aluminum Desensitizer (Comp D2) CACL	39.6% 37.8% 17.1% 5.0% 0.5%
16.	HMX	(Homecyclonite) (Cycloteramamethylene Tetranitramine)	100%
17.	KDNBF	Potassium Dinitro Benzofuroxan	
18	IMX-101	3-Nitro-1,2,triazol-5-one (NTO) 2,4-Dinitroanisole (DNAN) Nitroguanidine (NQ)	
19	IMX-104	RDX NTO DNAN	
20.	Lead Azide	Lead Azide	100%
21.	Lead Styphnate	Lead Styphnate	100%
22.	Military Dynamite – Medium Velocity	RDX TNT Starch SAE No. 10 Oil Polysobutylene	75% 15% 5% 4% 1%
23.	Military Dynamite – Low Velocity	RDX/Dye* TNT Tripentaery-Thritol Binder** Cellulose Acetate	17.5% 67.8% 8.6% 4.1% 2.0%

TABLE C-3B

CHEMICAL COMPOSITION OF WASTES TREATED OR STORED AT D&Z

Explosive		Chemical Make-up	
24.	Nitroglycerin	Nitroglycerin	100%
25.	Nitroguanidine (Picrate)	Picrate	100%
26.	NOL 130	Lead Azide Primer Mix RDX	.750 grains .230 grains .290 grains
27.	Octol	HMX TNT	75% 25%
28.	PAX-3	HMX Aluminum Bis (2,2)-Dinitropropyl) Acetal Diphenylamine	64% 20% 9.3% 0.2%
29.	PAX-21	RDX 2,4-Dinitroanisole (DNAN) Ammonium perchlorate (AP) n-Methyl-p-nitroanile (MNA)	20 – 35% 34 – 60% 20 – 30% .25%
30.	PAX-28	RDX DNAN AP MNA Aluminum powder	
31.	PBX	RDX Polystyrene Dioctylphthalate	
32.	PBXN-107	(Controlled Distribution)	
33.	PBXW-9	(Controlled Distribution)	
34.	PBXW-11	(Controlled Distribution)	
35,	PBXW-17	(Controlled Distribution)	
36.	Pentolite 10/90	PETN TNT	10% 90%
37.	Pentolite 50/50	PETN TNT	50% 50%
38.	PETN	Pentaerythrite Tetranitrate	100%
39.	Photoflash	Laminac Lupersol, DDM Iron Oxide	96.8% 3.0% 0.2%

TABLE C-3B

CHEMICAL COMPOSITION OF WASTES TREATED OR STORED AT D&Z

Explosive		Chemical Make-up	
40.	Picratol	Explosive D TNT	52% 48%
41.	RDX	(Cyclonite) (Cyclotrimethylele-Trinitramine)	100%
42.	TAL 1104	Copper Oxide Sodium Azide	
43.	Tetryl	Trinitro-Phenylmethyl-Nitramine	100%
44.	Tetryol	Tetryl TNT	
45.	TNT	Trinitrotoluene	
46.	Torpex	RDX TNT Aluminum	42% 40% 18%
47.	TPA Incendiary	Triethylaluminum	
48.	Tritonal	Aluminum TNT	

Notes:

* The dye is 96% pure 1-Methylamino-anthraquinone (1-A); amount used is 0.5% of the RDX mixture.

** The binder is Vistac No. 1, consisting of polybutene and diotyseabacate.

TABLE C-4

HAZARDOUS WASTES THERMALLY TREATED OR STORED AT D&Z

Waste Description	EPA RCRA Code	Hazardous Components	Storage Container	Designated Storage Area	Free Liquids?	Treatment Method
Explosive contaminated solvents	F001 F003 D001 D003	Acetone and various reactive explosives	55-gal. drums	1900/2700	Yes	Off-site
Explosives	D003	RDX, TNT, Comp CH6, Primer Mix, Comp A5, Comp B, Comp B-4, IMX-101, IMX-104, M-10 Propellants, Lead Azide, Cyclotol, Octol, TAL 1104, HMX, PBXN-5, AFX-708	Plastic-lined containers	1900/2700	No	Off-site
Spent carbon	K045	RDX/TNT	55-gal. drums	1800/1900/2700	No	Off-site
Diatomaceous earth	D003 K044	RDX/TNT, Cyclotol, octol	55-gal. drums	1900/2700	Yes	Off-site
Reject 105mm	D003	TNT or Comp. B	Palletize and band	1900/2700	No	OD
Primer M28B2	D003	Black powder	Cardboard boxes	1900/2700	No	Off-site
Spent stencil solvent	D001 D007 D008 F003	2-ethoxyethanol Chromium Lead Acetone	55-gal. drums	1900	Yes	Off-site
Vacuum dust and scrap explosive	D003	TNT or Comp. B, Cyclotol, octol, OSX-1, and 3, OSXCAN, PAX 2A, 3, 21, 28, & 46, IMX-104 and 101, CXM 3,& 9, LX-14 and CH-6	Cardboard boxes	1900/2700	No	Off-site
Dual grain propellant charges	D003	DNT, diphenylamine dibutylphthalate nitrocellulose	Fiber drums	1900/2700	No	Off-site
Sump sludge	K044	TNT, RDX, Cyclotol, Octol, CH6, PBXN05, TAL 1104, HMX	55-gal. drums	1900/2700	Yes	Off-site
105mm supplementary charge	D003	TNT	Wooden boxes	1900/2700	No	Off-site
120mm body loading assembly w/o fuze in casing	D003	Comp B	Pallet	1900/2700	No	OD

TABLE C-4

HAZARDOUS WASTES THERMALLY TREATED OR STORED AT D&Z

Waste Description	EPA RCRA Code	Hazardous Components	Storage Container	Designated Storage Area	Free Liquids?	Treatment Method
Wet Sumpage	D003	RDX, TNT, Cyclotol, octol, IMX-104 and 101, PAX 2A, 3, 21, 28, & 46	Plastic-lined containers	1900/2700	Yes	Off-site
Spent solvents	F001 F003 D001	Acetone 1,1,1-trichloroethane Petroleum naphtha	55-gal. drums	1900	Yes	Off-site
Spent solvents with explosives	F001 F003 D001 D003	Acetone 1,1,1-trichloroethane Petroleum naphtha Explosives	55-gal. drums	1900/2700	Yes	Off-site
Paint thinner	D001 F005	Toluene	55-gal. drums	1900	Yes	Off-site
C76A1 projectile HE cartridge	D003	M30 propellant	Pallet	1900/2700	No	OD
M106 projectile HE cartridge	D003	Comp B	Pallet	1900/2700	No	OD
M107 projectile HE	D003	TNT	Pallet	1900/2700	No	OD
M549 projectile HE cartridge	D003	Comp B	Pallet	1900/2700	No	OD
M549 projectile HE cartridge	D003	TNT	Pallet	1900/2700	No	OD
M795	D003	TNT	Pallet	1900/2700	No	OD
M795 supplemental charge	D003	TNT	Pallet	1900/2700	No	Off-site
Prop grain assembly aft	D003	AHH propellant	Fiberboard or wooden box	1900/2700	No	Off-site
Prop grain assembly fwd	D003	AHH Propellant	Fiberboard or wooden box	1900/2700	No	Off-site
PGMM warhead	D003	PAX-28	Wooden box	1900/2700	No	OD
60mm mortar	D003	PAX-21	Metal can	1900/2700	No	OD
Reject zirconium sponges	D003	Zirconium incendiary[1]	Cardboard boxes	1900/2700	No	Off-site
CEM booster assemblies	D003	RDX	Cardboard boxes	1900/2700	No	Off-site
CEM support collar assemblies	D003 D008	Lead azide, RDX, primer mix[4]	Cardboard boxes	1900/2700	No	Off-site
Linear shaped charges	D003	CH-6, PBXN-5	Cardboard boxes	1900/2700	No	OD
Anthracite	D003	Cyclotol, octol	Cardboard boxes	1900/2700	No	Off-site

TABLE C-4

HAZARDOUS WASTES THERMALLY TREATED OR STORED AT D&Z

Waste Description	EPA RCRA Code	Hazardous Components	Storage Container	Designated Storage Area	Free Liquids?	Treatment Method
SFW warhead assemblies	D003	Octol 75/25	Cardboard boxes	1900/2700	No	OD
Lithium batteries	D002 D003	Lithium	Cardboard boxes	1900/2700	No	Off-site
Spent stencil ink and solvent with acetone	D001 D007 D008 F003	2-ethoxyethanol Chromium Lead Acetone	55-gal. drums	1900	Yes	Off-site
Absorbent material	D003	TNT or RDX	55-gal. drums	1900/2700	No	Off-site
Dry sumpage	D003	Comp A-5 or TNT	Cardboard boxes	1900/2700	No	Off-site
BLU-97 bomblet	D003	Cyclotol	Fiberboard box	1900/2700	No	OD
BLU-97 lead assembly	D003	PBXN-5	Fiberboard box	1900/2700	No	Off-site
Bolt release chute f/ SFW	D003	IHE 1.4 restricted	Fiberboard box	1900/2700	No	Off-site
Cord cutter	D003	IHC 1.4 restricted	Fiberboard box	1900/2700	No	Off-site
Explosive bolt	D003	IHC 1.4 restricted	Fiberboard box	1900/2700	No	Off-site
Housing initiator	D003	CH-6	Fiberboard box	1900/2700	No	Off-site
JSOW warhead	D003	PBXW-11	Wooden box	1900/2700	No	OD
Manifold lead	D003	PBXN-5	Fiberboard or wooden box	1900/2700	No	Off-site
Parachute bolt	D003	IHC 1.4 restricted	Fiberboard or wooden box	1900/2700	No	Off-site
Piston actuator	D003	KDNBF	Fiberboard or wooden box	1900/2700	No	Off-site
Rockeye bomblets	D003	Comp B, MK118, CH-6, M55 Dets	Wooden box	1900/2700	No	OD
TMD fuze	D003	HNS Type 1 granular propellant	Fiberboard box	1900/2700	No	Off-site
BLU-108 bomblets	D003	PBXW-11	Fiberboard box	1900/2700	No	OD
BLU-97 fuzes	D003	NOL-130	Fiberboard box	1900/2700	No	Off-site

Notes:

[1] Elemental zirconium.

OD Open Detonation

TABLE C-5

DESCRIPTION OF WASTES THAT CANNOT BE THERMALLY TREATED OR STORED AT D&Z

SMOKES:

Titanium tetrachloride (FM)
Sulfur trioxide/chlorosulfonic acid (FS)
Hexachloroethane (HC) mixture (6.68% grained aluminum, 46.66% zinc oxide, and 46.66% hexachloroethane)
White phosphorus (WP)
Bulk red phosphorus (RP)
Plasticized white phosphorus (PWP)
Oil smoke
Colored smokes (e.g., red, yellow, green, violet, white)

INCENDIARIES:

Eutectic white phosphorus (EWP)
Napalm B (50% polystyrene, 25% benzene, 25% gasoline by weight)

Chemical Warfare Agents

TABLE C-6

THERMOCHEMICAL CHARACTERISTICS OF EXPLOSIVES

Material	Heat of Combustion (calories per gram @ constant pressure)	Heat of Formation (kilogram calories per mole)	EXPLOSION Heat (calories per gram, H_2O gas)	PRODUCTS Gas (milliliters per gram)
Primary Explosives				
Lead azide	--	-112 to -126.3	367	308
Mercury fulminate	938	-221 to -226	427	315
Diazodinitrophenol	--	956	820	
Lead Styphnate	1,251	92.3	460	440
Tetracene	--	270	658	1,190
Aliphatic Nitrate Esters				
BTN	2,167	368	1,458	--
DEGN	2,792	-99.4	1,161	--
Nitrocellulose				
Pyroxlyn (12% N)	--	-216	1,020	--
Guncotten (13.35% N)	2,313	-200	1,020	883.2
High nitrogen (14.14% N)	--	-191	1,810	--
Nitroglycerin	1,603	-90.8	1,486	715
PETN	1,957	-128.7	1,510	790
TEGN	3,428	-603.7	750	--
TMETN	2,642	-422	--	--
Nitramines				
HMX	2,231 to 2,253	11.3 to 17.93	1,480	--
RDX	2,259 to 2,284	14.71	1,480	908
EDDN	2,013	156.1	128 to 159	--
Haleite	2,477	20.11	1,276	908
Nitroguanide	2,021	20.29	880	1,077
Tetryl	2,914	4.67 to 7.6	1,450	760
Nitroaromatics				
Ammonium Picrate	2,745	95.82	800	--
DATB	--	-97.1 to -119	910	--
HNAB	--	-58 to -67.9	1,420	--
HNS	3,451	-13.9 to 1.87	1,360	--
TATB	2,850	-33.46 to -36.85	1,018	730
TNT	3,563 to 53,598	-10 to -19.99	1,290	980
Ammonium Nitrate	--	88.6	381	980

TABLE C-7

TESTING PARAMETERS

Generic Waste Category	Management Options	Test Parameter(s)	Rationale
Reject munitions items	Storage Treatment by OD	See Note 1 Reactivity	D003 listing, contain explosive components or constituents. Not tested prior to storage or treatment. Residues after treatment testing for reactivity to determine if additional treatment is required.
PEP Materials	Storage Treatment by OD	See Note 1 Reactivity	D003 listing, contain explosive components or constituents. No tests are conducted prior to storage or treatment. Treatment residues tested for reactivity to determine if additional treatment is required.
Explosive contaminated solvents	Storage	Reactivity TCLP for Heavy Metals, and Flash Point	D001 and D003 listing; contains explosives. Listed waste F003. No reason to believe other hazardous constituents may be present in significant concentrations. Material safety data sheets document constituents and characteristics.
PEP sludge/treatment wastes without lead base compounds	Storage	See Note 1 Reactivity	K044 listing; explosive-contaminated. Not tested prior to storage or treatment. Residues after treatment tested for reactivity to determine if additional treatment is required.
Spent stencil solvent	Storage Off-site/Recycle	TCLP for Pb, Cr Flash Point Acetone Content	D001 listing. Listed waste F003. Stencil ink contains lead chromate as pigment. Material Safety Data Sheets document constituents and characteristics. Test for ignitability to identify handling/shipping/storage requirements. Test for acetone and TCLP toxicity for lead and chromium to determine appropriate off-site recycling or disposal methods.

TABLE C-7

TESTING PARAMETERS

Generic Waste Category	Management Options	Test Parameter(s)	Rationale
Paint sludge and thinner	Storage Off-site/Recycle	TCLP for Pb, Cr Flash Point	Paint may contain Pb and Cr and may be ignitable. Test for ignitability to identify handling/storage/shipping requirements. Test for lead and chromium to determine appropriate off-site recycling or disposal methods.
Desensitized lead azide sludge	Storage Off-site treatment and/or disposal	Reactivity TCLP for Pb	K046 listing, D008 characteristic for lead. Test for reactivity first, if not reactive, test for TCLP toxicity to determine appropriate off-site treatment and/or disposal.
Industrial wastewater treatment (IWWT) sludge	Storage Off-site treatment and/or disposal	Reactivity TCL for Pb	K046 and/or K044 listing. May be explosive contaminated. Test for reactivity first; if not reactive, test for TCLP toxicity for lead to determine appropriate off-site treatment and/or disposal.
Spent carbon	Storage Off-site treatment and/or disposal	Reactivity and TCLP for Heavy Metals	K045 listing. Explosive contaminated. Not tested prior to storage. Reactivity and TCLP performed to determine appropriate management method.
Spent non-halogenated solvents	Storage Off-site/recycle	Flash Point	D001 listing. Listed waste F005. No reason to believe other hazardous constituents may be present in significant concentrations. Material safety data sheets document constituents and characteristics. Test for ignitability to determine handling/shipping/storage requirements.

TABLE C-7

TESTING PARAMETERS

Generic Waste Category	Management Options	Test Parameter(s)	Rationale
Spent halogenated solvents	Off-site/recycle	TCLP Heavy Metals and Flash Point	Listed wastes F001 and F002. Test for TCLP for heavy metals and flash point to determine handling/shipping/storage requirements. Constituents and characteristics are documented in Material Safety Data Sheets.

Notes:

1 Sampling of PEP items, reject munitions, and other items with explosive components or constituents is not routinely undertaken for safety reasons prior to storage or thermal treatment. Following specifications, document presence of PEP compounds in wastes prior to treatment.

TABLE C-8

AUTHORIZED WASTE CODES FOR D&Z

Characteristic Hazardous Waste Codes
D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011, D018, D022, D029, D030, D035
Hazardous Waste Codes from Non-Specific Sources
F001, F002, F003, F005
Hazardous Waste Codes from Specific Sources
K044, K045, K046, K047
Hazardous Waste Code for Discarded Commercial Chemical Products, Off-Specification Species, and Spill Residues
U122, U132

TABLE C-9

WASTE ANALYSIS PLAN SAMPLING METHODS

Generic Waste Category	Description of Sampling Method	Sampling Method	Equipment
Reject Munitions Items	See Footnote 1	N/A	N/A
PEP Materials	See Footnote 1	N/A	N/A
Explosive Contaminated Solvents	See Footnote 1	N/A	N/A
Spent non-halogenated solvents, halogenated solvents, and stencil solvent	Sample is taken from container representative composite	SW-846[2]	Coliwasa, tubing[4] Trier, Scoop, or Shovel
Paint Sludge and Thinner	Liquids sample and solids sample are taken from container representative composite	SW-846[2] ASTM D346-75[3] ASTM E300[3]	Tubing[4], Trier, Scoop, or Shovel

Notes:

1 Sampling of PEP items and reject munitions is not routinely undertaken for safety reasons prior to storage or thermal treatment. Following thermal treatment, the residue from these wastes may be sampled. Quality control testing and military specifications document presence of PEP compounds in wastes prior to treatment.

2 Method No. 1 Reference Test Methods for Evaluation of Solid Waste Physical/Chemical Methods USEPA SW-846.

3 ASTM International (ASTM) Annual book of ASTM Standards most recent edition / KAR 28-31- Appendix I.

4 Personal Protection and Safety Manual, USEPA National Training and Operational Technology Center, Cincinnati, Ohio, 1981, pp 3-1.

TABLE C-10

MAXIMUM ALLOWABLE CONTAMINATION LEVELS – TOXICITY CHARACTERISTIC LEACHING PROCEDURE CONSTITUENTS (40 CFR §261.24)

Constituent	Maximum Allowable (milligrams per liter)
Arsenic (D004)	5.0
Barium (D005)	100.0
Cadmium (D006)	1.0
Chromium (D007)	5.0
Lead (D008)	5.0
Mercury (D009)	0.2
Selenium (D010)	1.0
Silver (D011)	5.0

TABLE C-11

WASTE ANALYSIS PLAN FREQUENCY OF ANALYSIS

Generic Waste Category	Type of Analysis	Frequency of Analysis
Reject Munitions Items	Reactivity	See Footnote 1
Propellants, Explosives, and Pyrotechnics (PEP) Materials	Reactivity	See Footnote 1
Explosive Contaminated Solvents	Reactivity	See Footnote 1
PEP Contaminated Containers	Reactivity	See Footnote 1
PEP Sludge/Treatment Wastes without Lead-Based Compounds	Reactivity	Annually or test upon process / product change
Spent Non-Halogenated Solvents	Flash Point Toluene Acetone	Annually or test upon process / product change
Paint Sludge and Thinner	Toxicity Characteristic Leaching Procedure (TCLP) for Pb, Cr, Flash Point	Annually or test upon process / product change
Industrial Wastewater Treatment Sludge/Spent Carbon	Reactivity TCLP for Pb	Annually or test upon process / product change
Spent Halogenated Solvents	TCLP for Heavy Metals[2] Flash Point Tetrachloroethene 1,1,1-Trichloroethane	Annually or test upon process / product change

Notes:

Actual analysis will be determined based upon waste stream.

1 Sampling of PEP items and reject munitions is not routinely undertaken for safety reasons prior to storage or thermal treatment. Following thermal treatment, the residue from these wastes may be sampled. Quality control testing and military specifications document presence of PEP compounds in wastes prior to treatment.

TABLE C-12

SUMMARY OF ANALYTICAL METHODS USED FOR WASTES

Generic Waste Parameters and Characteristics Wastes:

Parameter	Analysis	Method Number*	Volume
Free Liquids	Paint Filter Test	9095	100 mL or 100 g
Ignitability	Flash Point	1010	100 mL
pH	pH	9040	30 mL
Moisture Content	Quality and Technical Services Division Standing (Q&TS) Operating Procedure (SOP) for RDX Pellet, Comp B, RDX, Lead, Comp A5, Cyclotol Type II	Specific Method***	5 g
Reactivity	Gap Test	Specific Method***	10 g
	Deflagration to Detonation Test	App. C*	10 g
TCLP Toxicity	TCLP	1310	100-500 g
Stability	Vacuum Stability	App. C*	10 g

Inorganic Wastes (Metals):

Parameter	Analysis	Method Number*	Volume
Arsenic	FAA	7060	100 mL or 100 g
Barium	FLAA	7080	100 mL or 100 g
Cadmium	FLAA	7130	100 mL or 100 g
Chromium	FLAA	7190	100 mL or 100 g
Lead	FAA	7421	100 mL or 100 g
Mercury	CV	7471	100 g
Selenium	FAA	7740	100 mL or 100 g
Silver	FLAA	7760	100 mL or 100 g

Organic Wastes:

Parameter	Analysis	Method Number*	Volume
Acetone	GC/MS (Volatile Organics)	8240	5 ml
Toluene	GC (Aromatic Volatile Organics)	8020	5 ml
1,1,1-Trichloroethane	GC (Halogenated Volatile Organics)	8010	5 ml
Tetrachloroethylene (Perchloroethylene)	GC (Halogenated Volatile Organics)	8010	5 ml

Notes:

*	Method number is listed in SW-846, *Test Methods for Evaluating Solid Waste*, USEPA.
**	No SW-846 method available; see discussion of method in the supplemental information.
***	Copies of these analytical methods are included in the supplemental information.

FAA	Furnace Atomic Absorption (Furnace Technique)	mL	Milliliter
FLAA	Flame Atomic Absorption (Direct Aspiration)	g	Gram
CV	Cold Vapor		
GC	Gas Chromatography		
MS	Mass Spectroscopy		

APPENDIX C-1

CHECKLIST FOR REVIEW OF KANSAS HAZARDOUS WASTE PROGRAM PERMIT APPLICATION

CHECKLIST FOR REVIEW OF FEDERAL RCRA PERMIT APPLICATIONS

SECTION C. WASTE CHARACTERISTICS

Section and Requirement		Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
C-1	Chemical and Physical Analyses	270.14(b)(2); 264.13(a)	Data generated by testing the waste, published data on the waste, or data gathered from similar processes may be used.	Section C-1	
C-1a	Containerized Waste	270.15(b)(1); 264.172	Demonstrate that waste is compatible with container construction materials.	Section C-1a	
C-1b	Waste in Tank Systems	270.16(a); 264.190(a); 264.191(b)(2); 264.192(a)(2)	Demonstrate that tank construction materials are compatible with waste stored in tank.	NA	
C-1c	Waste in Piles	270.18(a); 264.250(c)(1), (4)		NA	
C-1d	Landfilled Wastes	270.21(a) 264.13(c)(3); 264.314	Demonstrate that sorbent materials are non-biodegradable.	NA	
C-1e	Wastes Incinerated and Wastes used in Performance Tests	270.19(c); 270.62(b); 264.341		NA	
C-1f	Wastes to be Land Treated	270.20(b)(4); 264.271(a)(1), (2); 264.272; 264.276, Part 261 Appendix VIII	If food-chain crops will be grown in or on treatment zone, identify hazardous constituents reasonably expected to be in or derived from waste.	NA	
C-1g	Wastes in Miscellaneous Treatment Units	270.23(d)		Section C-1g	
C-1h	Wastes in Boilers and Industrial Furnaces	270.66(c); 266.102(b)		NA	
C-1i	Wastes on Drip Pads	270.26; 264.570		NA	
C-2	Waste Analysis Plan	270.14(b)(3); 264.13(b),(c)		Section C-2	
C-2a	Parameters and Rationale	270.14(b)(3); 264.13(b)(1)		Section C-2a	
C-2b	Test Methods	270.14(b)(3); 264.13(b)(2)		Section C-2b	
C-2c	Sampling Methods	270.14(b)(3); 264.13(b)(3)	If a sampling method described in 261 Appendix I is not used, facility must provide detailed description of proposed method and demonstrate its equivalency.	Section C-2c	
C-2d	Frequency of Analyses	270.14(b)(3); 264.13(b)(4)		Section C-2d	

CHECKLIST FOR REVIEW OF FEDERAL RCRA PERMIT APPLICATIONS

SECTION C. WASTE CHARACTERISTICS

Section and Requirement		Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
C-2e	Additional Requirements for Wastes Generated Off Site	270.14(b)(3); 264.13 (b)(5), (c); 264.73(b)	Describe statistical method used to determine a representative sample of incoming waste.	Section C-2e	
C-2f	Additional Requirements for Ignitable, Reactive, or Incompatible Wastes	270.14(b)(3); 264.13(b)(6); 264.17		Section C-2f	
C-2g	Additional Requirements Pertaining to BIF Facilities	270.22; 266.102(e)(6)(ii)(C),(e)(6)(iii)		NA	
C-3	Waste Analysis Requirements Pertaining to Land Disposal Restrictions	270.14(b)(3); 264.13; 264.73; Part 268		Section C-3	
C-3a	Waste Analysis	270.14(a); 264.13(a)(1); 268.1; 268.7; 268.9; 268.32 - 268.37; 268.41 - 268.43	Waste that was newly identified or newly listed as hazardous after 11/08/84 for which the U.S. Environmental Protection Agency has not promulgated land disposal prohibitions or treatment standards are not subject to land disposal provisions.	Section C-3	
C-3a(1)	Spent Solvent and Dioxin Wastes	270.14(a); 264.13(a)(1); 268.2(f)(1); 268.7; 268.30; 268.31		Section C-3	
C-3a(2)	California List Wastes	270.14(a); 264.13(a)(1); 268.7; 268.32; 268.42(a); RCRA Section 3004(d)		Section C-3	
C-3a(3)	Listed Wastes	270.14(a); 264.13(a)(1); 268.7; 268.33 - 268.36; 268.41 - 268.43	Arsenic-containing nonwastewater may use the extraction procedure (EP) toxicity test to determine compliance with treatment standards.	Section C-3	
C-3a(4)	Characteristic Wastes	270.14(a); 264.13(a)(1); 268.7, 268.9; 268.37; Part 268 Appendix I, IX	Characteristic D008 lead nonwastewater and D004 arsenic nonwastewater may use EP toxicity test to determine compliance with treatment standards.	Section C-3	
C-3a(5)	Radioactive Mixed Waste	270.14(a); 264.13(a); 268.7; 268.35(c),(d); 268.36(d); 268.42(d)	Hazardous debris containing radioactive waste must comply with treatment standards specified in 268.45.	NA	

CHECKLIST FOR REVIEW OF FEDERAL RCRA PERMIT APPLICATIONS

SECTION C. WASTE CHARACTERISTICS

Section and Requirement		Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
C-3a(6)	Leachates	270.14(a); 264.13(a); 268.35(a)	Leachate that originates from newly identified waste is not coded as F039 waste, but is labeled with newly listed waste code from which it is derived.	Section C-3	
C-3a(7)	Lab Packs	270.14(a); 264.13(a); 268.7(a)(7),(8); 268.42(c); Part 268 Appendix IV	Lab packs containing California list polychlorinated biphenyls (PCB) or dioxins must be treated according to special incineration requirements detailed in 268.42(a).	Section C-3	
C-3a(8)	Contaminated Debris	270.13(n); 268.2(g); 268.7; 268.9; 268.36; 268.45		Section C-3	
C-3a(9)	Waste Mixtures and Wastes with Overlapping Requirements	270.14(a); 264.13(a)(1); 268.7; 268.9; 268.41; 268.43; 268.45(a)	Waste that carries more than one characteristic or listed waste code must be treated to the most stringent treatment requirement for each hazardous waste constituent of concern.	Section C-3	
C-3a(10)	Dilution and Aggregation of Wastes	270.14(a); 268.3		Section C-3	
C-3b	Notification, Certification, and Recordkeeping Requirements	270.14(a); 264.13; 264.73; 268.7; 268.9(d)		Section C-3	
C-3b(1)	Retention of Generator Notices and Certifications	270.14(a); 264.13; 268.7(a)		Section C-3	
C-3b(2)	Notification and Certification Requirements for Treatment Facilities	270.14(a); 264.13; 268.7(b)		Section C-3	
C-3b(3)	Notification and Certification Requirements for Land Disposal Facilities	270.14(a); 264.13; 268.7(c)(1)		Section C-3	
C-3b(4)	Wastes Shipped to Subtitle C Facilities	270.14(a); 264.13; 268.7(a),(b)(6)		Section C-3	
C-3b(5)	Wastes Shipped to Subtitle D Facilities	270.14(a); 264.13; 268.7(d); 268.9(d)		Section C-3	
C-3b(6)	Recyclable Materials	270.14(a); 264.13; 268.7(b)(7)		Section C-3	
C-3b(7)	Recordkeeping	270.14(a); 264.13; 264.73; 268.7(a)(5),(a)(6),(a)(7), (d)	Recycling facilities must keep records of name and location of each entity receiving hazardous waste-derived product.	Section C-3	
C-3c	Requirement Pertaining to the Storage of Restricted Wastes	270.14(a); 264.73; 268.50		Section C-3	

CHECKLIST FOR REVIEW OF FEDERAL RCRA PERMIT APPLICATIONS

SECTION C. WASTE CHARACTERISTICS

Section and Requirement		Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
C-3c(1)	Restricted Wastes Stored in Containers	270.14(a); 264.73; 268.50(a)(2)(i)		Section C-3	
C-3c(2)	Restricted Wastes Stored in Tanks	270.14(a); 264.73; 268.50(a)(2)(ii)		Section C-3	
C-3c(3)	Storage of Liquid PCB Wastes	270.14(a); 264.73; 268.50(f)		Section C-3	
C-3d	Exemptions, Extensions, and Variances to Land Disposal Restrictions			Section C-3	
C-3d(1)	Case-by-Case Extensions to an Effective Date	270.14(b)(21); 268.5		Section C-3	
C-3d(2)	Exemption from Prohibition	270.14(b)(21); 268.6		Section C-3	
C-3d(3)	Variance from a Treatment Standard	270.14(a); 264.73; 268.7; 268.44		Section C-3	
C-3d(4)	Requirements for Surface Impoundments Exempted from Land Disposal Restrictions	270.14(a); 264.13(b)(7); 268.4; 268.14		Section C-3	
C-3d(4)(a)	Exemption for Newly Identified or Listed Wastes	270.14(a); 264.13; 268.14	If owner/operator continues to treat newly listed or characteristic hazardous waste after 48 months from promulgation of new waste listing or characteristic, surface impoundment must be in compliance with 268.4.	Section C-3	
C-3d(4)(b)	Treatment of Wastes	270.14(a); 264.13; 268.4(a)(1),(b)		Section C-3	
C-3d(4)(c)	Sampling and Testing	270.14(a); 264.13(b)(6); 268.4(a)(2)(i),(iv)		Section C-3	
C-3d(4)(d)	Annual Removal of Residues	270.14(a); 264.13(b)(7)(iii); 268.4(a)(2)(ii)		Section C-3	
C-3d(4)(e)	Design Requirements	270.14(a); 264.13; 268.4(a)(3),(4) 268.4(a)(3),(4))(3((2642		Section C-3	

Notes:

[a] Considerations in addition to the requirements presented in the regulations.

[b] For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.

[c] If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.